DEC 21 1937

STATISTICAL BULLETIN

METROPOLITAN LIFE INSURANCE COMPANY

VOLUME 18 NOVEMBER . 1937 NUMBER 11

Profit and Loss Statement of Human Lives

MORE than three quarters of a million deaths in our white population alone are prevented in the course of one year under modern conditions by the improvement in mortality which has occurred since 1900.

Actually, the deaths of 1,207,359 white persons were recorded in this country in 1935; had our white population of that year experienced the death rates, by sex and age, observed in 1900, our vital statistics registers would have reported 1,975,761 white deaths. The difference between 1,975,761 expected deaths and 1,207,359 actual deaths, or 768,402, represents the number of lives that have been saved in 1935 by the general decrease in the mortality in that year from that of 1900. Expressed as a ratio, this saving in lives is 38.9 percent of the number of expected deaths.

Many different causes contribute to the total death rate, and the improvement in mortality has been very unevenly divided among them; a few have actually shown retrogression. This is clearly shown in the table on page 3, which summarizes the outstanding facts, as they appear from the statistics for the year 1935, the latest for which the requisite data are available.

Of the 15 specific causes of death shown in the table, the changes in mortality among 11 were such as to result in a saving in lives. Among those that have improved, tuberculosis ranks first, with a saving of more than 173,000 lives in 1935 alone. With an annual saving of this magnitude, it requires little imagination to picture the social and economic advantages gained. Second in rank to tuberculosis will be found influenza and pneumonia, with a saving of practically 122,000 lives during 1935. Widespread application of the results of present researches on pneumonia should lead to even more substantial savings.

Diarrhea and enteritis, which ranks third in the list with an annual saving of about 108,000 lives, is of particular interest because practically all of these lives were saved in infancy and very early childhood. For each of these children there lies ahead a lifetime of social and economic activity. Much the same may be said with regard to the 59,000 lives saved by the improvement of the mortality from the principal communicable diseases of

childhood. Of these, diphtheria alone accounts for 36,000 lives.

Typhoid and paratyphoid fevers are fifth on the list of causes of death with a favorable showing. In this case there is noted a saving of about 33,000 lives, or practically 93 percent of the number that would have been lost had the sanitary conditions of 1900 remained unchanged. The "savings" recorded in the table for nephritis and cerebral hemorrhage and softening, which number about 26,000 and 17,000 respectively, are to a large extent artificial and arise from improvements in diagnostic practice and changes in statistical classification of deaths. The diseases of the puerperal state rank last in the list of causes of death with a saving in lives, as shown in the table on page 3. The number saved was barely 4,500; but in considering this figure one has to take into account the great decline in the birth rate since the beginning of the century.

For only four causes of death shown in the table have the changes in mortality resulted in a loss of lives beyond that expected on the basis of conditions in 1900. In order of rank these were organic heart disease, with an additional loss of about 59,000 lives; cancer, with 43,000 additional lives lost; diabetes, with 12,000; and external causes, excluding suicides, with 10,000. Although a part of the retrogression in the case of organic heart disease, cancer, and diabetes may be attributed to improved diagnostic technique, there undoubtedly were other fundamental factors present in the case of heart disease and diabetes, particularly at the older ages. Of course, in the figure for the total lives saved, the effect of errors of diagnosis cancels out, since they merely transfer deaths from one cause to another.

In our mode of living one great change has taken place since 1900: some twenty-nine million motor cars on our streets and highways have introduced an entirely new hazard; accidental deaths from this cause alone today run well in excess of 30,000 annually. If, then, in our table we see an increase of 10,000 in the deaths from external causes, this implies that aside from deaths from automobile accidents there would actually have been a very distinct saving under this heading. Lastly, the changes in various causes of death which cannot be shown in detail on the table contributed together a net saving of 350,000 lives.

We have done well. We have good reason to look back and congratulate ourselves on what has been achieved. But we might have done better. Our contemporaries in New Zealand are doing better. If we could have established in our population the very favorable mortality rates prevailing in New Zealand, there would have been only 914,000 deaths in 1935 in place of the 1,207,359 actually recorded. Thus, an additional 300,000 lives might have been saved if we had attained the mortality standard of New Zealand.

*Actual Deaths in the White Population of the United States During 1935 from All Causes of Death and from Several Prominent Causes of Death, Compared with the Corresponding Numbers Expected in That Year on the Basis of the Mortality Rates by Sex and Age Prevailing in 1900**

Cause of Death	Deaths in 1935		Lives Saved in 1935 by Improvement in Mortality Since 1900	Lives Lost in 1935 by Retrogression in Mortality Since 1900
	Actual	Expected on Basis of Mortality in 1900		
All Causes	1,207,359	1,975,761	768,402	
Tuberculosis, all forms	51,269	224,384	173,115	
Influenza and pneumonia†	110,191	232,187	121,996	
Diarrhea and enteritis‡	17,018	125,448	108,430	
Principal communicable diseases of childhood	13,182	72,127	58,945	
Measles	3,435	12,590	9,155	
Scarlet fever	2,646	9,336	6,690	
Whooping cough	3,673	10,715	7,042	
Diphtheria	3,428	39,486	36,058	
Typhoid and paratyphoid fever	2,386	35,652	33,266	
Nephritis	89,240	115,239	25,999	
Cerebral hemorrhage and softening	85,732	102,535	16,803	
Puerperal state	10,018	14,504	4,486	
Organic heart disease	212,167	153,584		58,583
Cancer	129,124	86,103		43,021
Diabetes	26,606	14,301		12,305
External causes (excluding suicides)	94,851	84,688		10,163
All other causes	365,575	715,009	349,434	

*As observed in the Original Death Registration States and the District of Columbia, 1900.
†Excluding capillary bronchitis. ‡Includes duodenal ulcer.

The Problem of Pneumonia Control

The development of antipneumococcus serum, which ranks among the most important recent advances in medical science, is revolutionizing the clinical treatment of pneumonia. This new and effective weapon is now being used as the spearhead of a national attack on the disease by the United States Public Health Service and other health agencies under the leadership of Surgeon General Parran. The Metropolitan Life Insurance Company takes particular interest in the campaign to curb pneumonia mortality, because much of the recent knowledge on serum therapy has become available through the work done under the direction of, or with the cooperation of, the Influenza-Pneumonia Commission, organized by the Metropolitan almost 20 years ago.

Pneumonia provides a broad and

fertile field for life conservation work. The disease accounts for well in excess of 100,000 deaths a year in the United States, a toll greater than that from any other communicable disease, and 1½ times that from tuberculosis. Moreover, pneumonia is a contributing factor in many thousands of deaths annually allocated to other causes in official mortality records. Not only is the disease a leading cause of death at all ages combined, but it is prominent in the mortality picture throughout the entire range of life.

The mortality from pneumonia is by no means equal for the two sexes. Among Metropolitan Industrial policyholders the standardized annual death rates from this cause are about 50 percent higher for males than for females. As the table on page 6 shows, the average death rate in the quinquennium 1931–1935 was 64.0 per 100,000 for white males, 41.9 for white females, 122.9 for colored males, and 84.3 for colored females. The excess of male mortality obtains at virtually every age period, the greatest excess being registered at 35 to 54 years.

Why are males the chief victims of pneumonia? Occupation is one important factor. A study made by the Metropolitan Life Insurance Company some years ago showed that certain industrial conditions are associated with a high incidence of pneumonia. The most important of these hazards are dust, extreme heat, sudden variations in temperature, and exposure to the weather. General habits of life also exert their influence. Chronic alcoholics, of whom the large majority are males, are particularly susceptible to pneumonia; in addition they have a much higher case fatality rate than do other individuals of the same age. It is also true generally that men lead less careful and less sheltered lives than women, and hence are more apt to neglect minor respiratory infections until they develop into pneumonia. But, as a matter of fact, greater vulnerability of the male to the disease is apparent even in infancy and early childhood.

The pneumonia problem is particularly serious among Negroes, the death rate in this group averaging about twice that for white persons. A definitely higher mortality rate is recorded for the colored throughout life, and at some age periods the ratio of the colored to the white death rate is more than three to one.

Age is an important element in the pneumonia picture. The death rates from the disease rise to their highest levels at the two extremes of life, and particularly at the older ages. However, as far as actual numbers of deaths are concerned, more than one quarter of the total occur among persons under 15 years of age, and more than 40 percent of the total take place at the main working period of life, ages 15 to 64, thus robbing families of their breadwinners and industry of its producers.

In surveying the magnitude of the pneumonia problem and in pointing out the sections of the

population most affected, we have considered pneumonia as if it were one disease entity. Actually it is a group of communicable diseases commonly caused by different types of pneumococci. Up to the present time 32 such different types have been isolated. Therapeutic serums of unquestioned value have been produced for Types I, II, V, VII, VIII, and a few others. From the viewpoint of clinical treatment, it is fortunate that the majority of lobar pneumonia cases fall within these relatively few types. In bronchopneumonia, Types I and II pneumococci are present only infrequently; Type III pneumococcus and the higher types are the more common. Furthermore, in a sizable proportion of the cases the causative organism is other than the pneumococcus. It is because of this that serum treatment is at present virtually limited to lobar pneumonia.

At the present time serum therapy is the most potent weapon available in the war against pneumonia. According to authoritative opinion, if serum treatment were widely applied throughout the country the mortality from lobar pneumonia could be reduced one half. To apply this new weapon successfully, it will be necessary to have adequate laboratory facilities for typing and to have available a supply of serum which can be given without charge to those unable to pay for the commercial product. The pneumonia control programs of two States—Massachusetts and New York—and of New York City may well serve as models for other health departments.

While serum therapy for pneumonia is rapidly developing into a major success of modern medicine, there are already signs of a possibly even more important development. Experiments still in progress, with preventive vaccines, have already yielded encouraging preliminary results. When we reflect how highly successful immunization has proved to be in relation to other diseases, we cannot but attach the greatest significance to the efforts now in progress towards perfecting this aid against the deadliest of the more common communicable diseases.

Other methods of attacking the problem must be used, too. A wide program of health education for the general population should stress the fact that other respiratory infections generally precede the development of a case of pneumonia, and that minor respiratory infections should be cared for before they develop into the more serious disease. The cooperation of the layman is also necessary for the prompt treatment of the pneumonias. If the physician is not called early in the course of the disease, even serum treatment may prove to be quite ineffective, because its efficacy diminishes with the duration of the disease. More adequate nursing care of pneumonia provides another important avenue for curbing the mortality from the disease. The major problem of pneumonia can be brought under control if we will but use intelligently the aids which medical science have made available to us.

Pneumonia—All Forms. Averages of Annual Death Rates per 100,000. By Color, Sex, and Age. Ages 1 to 74 years. Metropolitan Life Insurance Company, Industrial Dept., 1931 to 1935

Age Period Years	White		Colored		Percent Male of Female	
	Males	Females	Males	Females	White	Colored
1 to 74*	64.0	41.9	122.9	84.3	152.7	145.8
1 to 4	83.9	73.4	172.3	150.2	114.3	114.7
5 to 9	15.1	13.7	26.6	21.4	110.2	124.3
10 to 14	9.0	9.0	22.5	18.3	100.0	123.0
15 to 19	15.0	10.4	48.9	34.7	144.2	140.9
20 to 24	17.4	14.0	57.1	50.1	124.3	114.0
25 to 34	31.1	21.9	100.1	62.0	142.0	161.5
35 to 44	70.5	33.3	148.5	82.0	211.7	181.1
45 to 54	116.2	51.8	218.9	118.3	224.3	185.0
55 to 64	202.3	121.1	292.0	191.7	167.1	152.3
65 to 74	367.2	284.9	479.1	394.9	128.9	121.3

*Standardized for age.

The Chances of Accidental Death

More than 100,000 persons, that is about one in every 1,300, will die this year as the result of accidental injury in the United States. The American people have by this time become fairly well acquainted with the general facts regarding this disquieting situation. Nevertheless, the significance to each of us of the frequency of serious accidents is probably not fully realized. Perhaps one of the most striking ways to bring the facts home is by considering the probability for any given person that he will eventually die as the result of accidental injury. Looking at the matter this way, certain facts are revealed which may come as a surprise to many readers. How many of us know, for example, that the probability of eventually dying by falls is almost twice as great for a girl as for a boy? This is one of a number of remarkable facts disclosed in an analysis by this Company of statistics published by the United States Bureau of the Census for the year 1935.

The chances of ultimately dying by accidental injury of any kind depend upon the age and sex of the person under consideration. As a fundamental figure we may consider the chances as they present themselves for a newborn child. According to the conditions prevailing in 1935, out of every 1,000 children born in that year, 62 will ultimately die by one or another of the accidental injuries. Out of the total of 2,155,000 babies actually born alive in that year, more than 133,000 will eventually die of accidental injury,

assuming, of course, that conditions similar to the present will continue to prevail.

The risk of accidental death varies materially according to the sex of the child. For a white male child the chances are 78 in 1,000. As this individual goes through life, the chances of ultimately meeting accidental death at first increase slightly, reaching a maximum at age 5, namely 80 per 1,000. After this, the chances steadily diminish to 70 in 1,000 at age 25, to 59 at age 40, and to 42 per 1,000 at age 70. After age 70 there is again a slight increase in the probability. Curiously enough, the situation is very different as regards white females. Their chances of ultimately dying from accidental injury are greatest, not in infancy, as among males, but at extreme old age. At birth their chances are 49 in 1,000, and they vary but little from this figure up to age 60, after which the probability increases rapidly with advancing age, to 66 per 1,000 at age 80.

The contrast between the probabilities for males and females presents other points of interest which it is worth while to summarize briefly. At birth the chances that a male child will ultimately die of accidental injury are about 1½ times that for a baby girl. This is in keeping with the general impression and the statistical findings that the death rate from accidents is considerably higher for males than for females. But the matter is not so simple as this. The disparity of the sexes in the probability of dying from accidents diminishes greatly with age, and beyond age 60 the chances are actually greater for the female than for the male, so that the relative position of the two sexes is the reverse of that found at the beginning of life; at age 80 the chances of a female eventually dying by accident are 66 in 1,000, as against 45 in a thousand for males. This excess for females as compared with males at the higher ages is due, in part, to actually greater proneness to accident of these aged women, as compared with men of the same age. But the disparity of the probabilities is further enhanced by the fact that women have a lesser mortality from disease than men, which increases their chances of dying from accident.

The figures so far cited relate to all accidents considered jointly. One naturally inquires into further details with special regard to the several outstanding forms of accidental death. Uppermost in the public mind today are automobile accidents. Some 29,000,000 cars travel our roads, and on the average about one person in five is the owner of an automobile, in many instances of an automobile that perhaps should not be on the road. The very substantial risk of death from automobile accidents is clearly apparent when we consult the figures in the accompanying table, which presents data for decennial ages. These figures show that the probability for a newborn white male of eventually being killed in an automobile accident is 29 per 1,000.

The corresponding probability for a white female is much lower, namely just over 10 per 1,000. As a matter of fact, a male, at any age between birth and 55 years, has a greater prospect of being killed in an automobile accident than in any other kind of accident. However, as age advances, the probability of being killed in this way diminishes both for males and females.

As already mentioned above, some features of singular interest appear when we examine the figures relating to deaths from falls. For females, throughout life, the probability of dying from this type of accidental injury exceeds that from any other form of accident, and at birth the probability of eventually meeting with this fate amounts to considerably more than half the total probability of dying from accidents of any form. At advancing ages the probability of dying as a result of a fall rises very steeply. It is a remarkable fact brought out by these figures that even though the mortality from all causes of death combined increases rapidly at these higher ages, the mortality from falls increases even faster than that from all causes of death combined. From age 55 on, for males as well as for females, the probability of eventually dying from falls is higher than that for any other accidental cause.

A form of accidental death which takes its victims predominantly among the males is drowning. For the newborn white male the probability of eventually dying from this cause is four in 1,000. The corresponding probability for a white female baby is much less, being only seven in 10,000.

In contrast with the case of drowning, deaths from burns are more common among females than among males. For the newborn white female the chances of eventually dying from accidental burns are 3.4 per 1,000, as against 2.5 per 1,000 for the white male. The higher figure shown by females extends throughout life.

The whole problem of accident prevention is one of such great importance that we can only gain by looking at it from every possible angle. The point of view here presented, which contemplates the probabilities at various ages of life of eventually becoming the victim of an accident, may be helpful in this connection. On the one hand, it brings out definitely the fact that the risk we all run of eventually meeting with a fatal accidental injury is definitely measurable. On the other hand, it may serve to preserve us against having an exaggerated fear of these possibilities. Their exact measure, as computed in terms of probability, tells us definitely how great the risk is to which we are exposed.

Chances per 1,000 of Eventually Dying from Accidents, All Forms, and from Specified Forms. Total Persons and White Persons, by Sex and Age; United States, 1935

Sex	Age								
	0	10	20	30	40	50	60	70	80
	Accidents, Total								
Total Persons	61.8	61.9	59.0	54.8	51.4	48.0	45.7	46.6	54.9
White males	77.6	78.6	74.0	66.4	59.5	52.3	45.9	41.8	45.2
White females	48.6	48.0	46.8	45.9	45.7	46.1	47.7	53.5	66.3
	Automobile Accidents*								
Total Persons	19.7	20.0	18.7	16.2	14.3	12.3	10.2	7.6	4.9
White males	29.4	30.2	28.3	24.1	20.9	17.8	14.6	11.0	7.6
White females	10.3	10.0	9.1	8.1	7.4	6.6	5.5	4.1	2.4
	Falls†								
Total Persons	19.4	20.6	20.8	21.3	21.9	22.8	25.0	30.3	41.9
White males	16.0	17.0	17.0	17.1	17.1	17.1	18.0	20.7	29.0
White females	27.4	29.0	29.3	30.0	30.9	32.5	35.6	42.9	57.4
	Burns†								
Total Persons	3.2	2.6	2.5	2.3	2.2	2.0	2.0	2.0	2.2
White males	2.5	2.0	2.0	1.8	1.6	1.4	1.3	1.4	1.5
White females	3.4	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.2
	Drownings†								
Total Persons	2.7	2.5	1.8	1.5	1.2	.9	.6	.4	.3
White males	4.4	4.1	3.1	2.6	2.1	1.5	1.0	.6	.4
White females	.7	.5	.3	.3	.2	.2	.1	.1	.1

*Includes collisions with railroads and streetcars.
†Excludes deaths associated with other types of accidents.

Health Record for October 1937

THE extremely low death rate of 7.4 per 1,000 was registered in October among the more than 17,500,000 Industrial policyholders in the Metropolitan Life Insurance Company. This is practically the same as the mortality rate for October a year ago, which was the lowest ever registered for this particular month in this important cross-section of the population.

The cumulative death rate for the 10-month period January to October (8.3 per 1,000) is also the lowest on

record for this part of any year and is 7/10 of 1 percent below the previous minimum as registered for the like part of 1935, and 1.1 percent below the corresponding figure of last year. Inasmuch as the full year 1936 established a new low mortality rate for these insured wage-earners and their families, it is obvious that prospects are good for the current year to close with the best health record of all.

The improvement this year has not extended to the Metropolitan's 1,250,000 Industrial policyholders in Canada. Their year-to-date death rate is 5.8 percent higher than at this time in 1936 and is, in fact, the highest for four years. This does not mean that the insured in Canada are experiencing an unfavorable health year, for their cumulative death rate is still relatively low. There have been, however, sharp increases this year in Canada in deaths from diarrheal diseases, whooping cough, and accidents; and the high mortality from these conditions accounts for the most part for Canada's less favorable mortality record as compared with recent years.

Among the total Industrial policyholders seven diseases are at the present time running lower cumulative mortality rates than ever before, and there is thus a good chance that they will register new minima for the entire year 1937. These diseases are typhoid fever, scarlet fever, diphtheria, tuberculosis, syphilis (including locomotor ataxia and general paralysis of the insane), chronic nephritis, and diseases incidental to pregnancy and childbirth. In addition to the above there are several other diseases which are recording lower mortalities than at this time last year, notably, cerebral hemorrhage, heart disease, and pneumonia.

The year's record for fatal accidents (all forms) is also more favorable than it has ever been before, and 1937 bids fair to go on record as registering the lowest accident death rate of all time among the insured wage-earning population. There has been, unfortunately, a rise of nearly 8 percent in the death rate for automobile accidents; and unless there is improvement in November and December, the 1937 automobile accident death rate will closely approach the previous maximum as recorded in 1931.

Reports of the prevalence of sickness from reportable diseases in the general population of the United States show that there were sharp rises in October, as compared with September, in cases of influenza, diphtheria, measles, scarlet fever, and smallpox; on the other hand, seasonal declines were recorded for poliomyelitis and typhoid fever, as is naturally expected at this time of the year. In comparison with October a year ago, measles cases almost trebled in number, smallpox cases showed an 80-percent rise, and poliomyelitis a 25-percent rise. There was little change in the incidence of the other communicable diseases except that there was much lower prevalence of typhoid fever.

The following table shows the mortality among Industrial policyholders for October 1937, September 1937, and October 1936, together with the cumulative rates for the first 10 months of each year.

METROPOLITAN LIFE INSURANCE COMPANY

Death Rates per 100,000 for Principal Causes. Weekly Premium-Paying Business in Industrial Department. All Ages (Annual Basis)*

MONTHS OF OCTOBER 1937, SEPTEMBER 1937, AND OCTOBER 1936.

CAUSES OF DEATH	ANNUAL RATE PER 100,000 LIVES EXPOSED*				
	October 1937	September 1937	October 1936	Cumulative January-October 1937	Cumulative January-October 1936
TOTAL—ALL CAUSES	744.5	703.5	739.5	834.3	843.3
Typhoid fever	1.0	1.7	1.4	.9	1.0
Measles	.3	.5	—	1.1	1.0
Scarlet fever	1.1	.5	1.0	1.6	2.2
Whooping cough	2.7	2.8	1.9	3.2	1.6
Diphtheria	2.3	1.0	1.7	1.6	1.7
Influenza	4.7	2.3	5.2	19.4	15.0
Tuberculosis (all forms)	42.9	43.6	52.4	52.0	54.3
Tuberculosis of respiratory system	38.1	39.2	47.8	46.7	48.2
Syphilis, locomotor ataxia, and general paralysis of the insane	9.1	9.9	9.7	10.7	11.6
Cancer (all forms)	86.8	90.5	89.5	92.8	91.0
Diabetes mellitus	23.2	22.0	19.9	25.1	24.3
Cerebral hemorrhage; apoplexy	56.2	50.8	53.5	58.8	61.4
Diseases of the heart†	141.2	123.7	137.1	157.2	159.8
Diseases of the coronary arteries	28.6	29.3	26.3	29.8	24.7
Angina pectoris	6.5	6.8	7.2	7.7	8.4
Pneumonia (all forms)	41.1	23.5	37.6	68.5	70.3
Diarrhea and enteritis	12.4	17.8	12.6	9.3	8.6
Appendicitis	10.5	12.0	11.7	11.2	11.4
Chronic nephritis (Bright's disease)	50.5	46.1	50.8	54.8	58.8
Puerperal state—total	5.5	5.9	7.0	6.7	7.8
Suicides	6.7	9.1	7.5	8.6	8.6
Homicides	4.9	4.3	4.8	4.8	4.8
Accidents—total	51.8	54.9	54.7	53.9	57.6
Automobile accidents	23.3	22.9	22.4	20.5	19.0
All other diseases and conditions	154.4	144.7	146.2	154.4	157.3

*The rates for 1937 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†Excludes pericarditis, acute endocarditis, acute myocarditis, and angina pectoris.

Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

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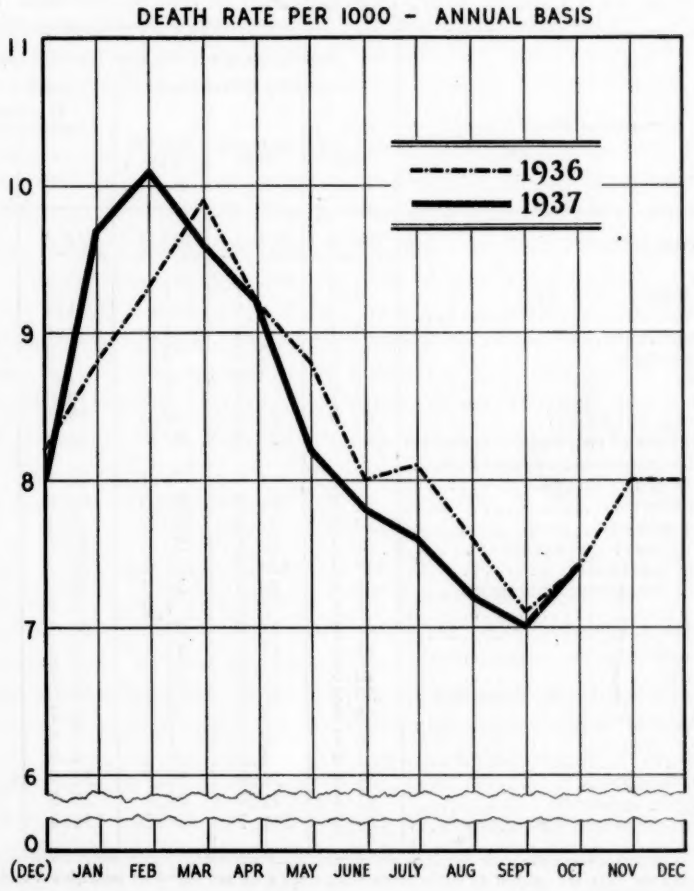
DEATH RATES FROM ALL CAUSES

METROPOLITAN LIFE INSURANCE CO. – INDUSTRIAL DEP'T.
WEEKLY PREMIUM-PAYING BUSINESS – TOTAL PERSONS



	(DEC)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1936	8.8	9.3	9.9	9.2	8.8	8.0	8.1	7.6	7.1	7.4	8.0	8.0	
1937	9.7	10.1	9.6	9.2	8.2	7.8	7.6	7.2	7.0	7.4			

Rates are provisional for 1937

METROPOLITAN LIFE INSURANCE COMPANY PRESS
NEW YORK, U.S.A.
78655